

WHAT IS CLAIMED IS:

5

1. A manufacturing method of a semiconductor device, comprising the steps of:

10 providing a rigid substrate which supports one or more semiconductor elements on a surface of the substrate and is clamped between an upper mold and a lower mold of an encapsulation mold at a time of resin encapsulation, so that a vent-end edge portion of the substrate corresponding to a vent end of the encapsulation mold has a thickness smaller than a thickness of other portions of the substrate;

15 disposing the substrate in the encapsulation mold; and

injecting resin into a cavity between the upper mold and the substrate to encapsulate the semiconductor elements with the resin.

20

25 2. The manufacturing method of claim 1 wherein the substrate is provided so that only a part of the vent-end edge portion of the substrate has a thickness smaller than the thickness of the other portions of the substrate.

30

3. A manufacturing method of a semiconductor device, comprising the steps of:

35 providing an encapsulation mold having an upper mold and a lower mold for clamping a rigid substrate, which supports one or more semiconductor elements on a surface of the substrate, between the upper mold and the lower mold at a time

of resin encapsulation, so that the low mold has a void at a vent end of the encapsulation mold which confronts a vent-end edge portion of the substrate;

5 disposing the substrate in the encapsulation mold;
and

injecting resin into a cavity between the upper mold and the substrate to encapsulate the semiconductor elements with the resin.

10

4. A manufacturing method of a semiconductor device, comprising the steps of:

15 providing a rigid substrate which supports one or more semiconductor elements on a front surface of the substrate and is clamped between an upper mold and a lower mold of an encapsulation mold at a time of resin encapsulation;

20 attaching a cover film to a back surface of the substrate so that the back surface of the substrate except a vent-end edge portion of the substrate corresponding to a vent end of the encapsulation mold is covered by the cover film so as to form a void at the vent-end edge portion;

25 disposing the substrate with the cover film in the encapsulation mold; and

injecting resin into a cavity between the upper mold and the substrate to encapsulate the semiconductor elements with the resin.

30

5. A manufacturing method of a semiconductor device, comprising the steps of:

35 providing an encapsulation mold having an upper mold and a lower mold for clamping a rigid substrate, which supports one or more semiconductor elements on a surface of the

substrate, between the upper mold and the lower mold at a time of resin encapsulation;

attaching a release film to a surface of the lower mold so that the surface of the lower mold except a portion confronting a vent-end edge portion of the substrate corresponding to a vent end of the encapsulation mold is covered by the release film so as to form a void at the vent-end edge portion;

disposing the substrate in the encapsulation mold;

and

injecting resin into a cavity between the upper mold and the substrate to encapsulate the semiconductor elements with the resin.

6. A manufacturing method of a semiconductor device, comprising the steps of:

providing a rigid substrate which supports one or more semiconductor elements on a surface of the substrate and is clamped between an upper mold and a lower mold of an encapsulation mold at a time of resin encapsulation;

forming the substrate with a slit located near a vent-end edge portion of the substrate corresponding to a vent end of the encapsulation mold;

attaching a release film to a surface of the lower mold so that the entire surface of the lower mold is covered by the release film;

disposing the substrate with the slit formed therein in the encapsulation mold; and

injecting resin into a cavity between the upper mold and the substrate to encapsulate the semiconductor elements with the resin.

7. A manufacturing method of a semiconductor device, comprising the steps of:

disposing a rigid substrate, which supports one or more semiconductor elements on a surface of the substrate,
5 between an upper mold and a lower mold of an encapsulation mold;

clamping the substrate with the upper mold and the lower mold by setting a clamping pressure to a first pressure that is small enough to allow separation of the upper mold from
10 the substrate surface at a vent-end edge portion of the substrate;

injecting resin into a cavity of the encapsulation mold;

setting, after an end of the resin injection, the clamping pressure to a second pressure that is larger than the
15 first pressure and enough to compress the substrate surface by the upper mold at the vent-end edge portion; and

encapsulating the semiconductor elements supported on the substrate surface with the injected resin.

20

25

30

35